CENTRAL INTELLIGENCE AGENCY

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COUNTRY USSR (Saratov Oblast; Ukrainian SSR)

REPORT

SUBJECT 1. Saratov Refrigerator Factory
2. Nikopol Southern Pipe Plant

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Two reports on industrial plants in Saratov and Nikopol Attachment 1 is a report on the Refrigerator Factory in Saratov and contains information on its location, production, employees, utilities, and security precautions. Attachment 2 is a report on the Southern Pipe Plant in Nikopol and includes information on location, layout, production, security measures, labor supply, working conditions, and personalities.

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(Note: Washington distribution indicated by "X"; Field distribution by "#".)

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SARATOV REFRIGERATOR PLANT

General

1. [redacted] the Saratov Refrigerator Plant (Zavod 306), [redacted] had formerly been an aircraft magneto manufacturing plant during World War II. The plant was located approximately four kilometers northeast of Saratov, along the Saratov-Moscow railroad. [redacted] the plant consisted of three one-story buildings, two of which contained the plant administrative staff and the third contained the actual machine shops and assembly line for the production of refrigerators. [redacted] 25X1

Production

2. Refrigerators in three sizes, known as Saratovich Nos. 1, 2, and 3, copied from German and English models, were produced at the Saratov plant. The most popular model was a small, four cubic foot, electric motor refrigerator which sold for approximately 1,000 rubles. [redacted] most of these refrigerators were bought by government officials or those in high income brackets. [redacted] repatriates were permitted to purchase refrigerators prior to their return to Spain as a propaganda effort to illustrate the buying capacity of the Soviet worker.

[redacted]

SECRET [redacted] 25X1

FORM NO. 51-58 APR 1953 PREVIOUS EDITION [redacted] SED. [redacted] 25X1 (20)

electric furnaces for tempering metal parts.

4. the materials received at his shop were frequently substandard in quality, and reject these supplies they were were delivered by rail once a month. These materials were not stockpiled, but were taken directly to the processing shops concerned.

5. Finished refrigerators were taken to truck loading platforms for shipment to various cities throughout the Soviet Union.

Labor

6. Factory hours were from 0800 until 1700, with one hour for lunch. there were no work stoppages nor evidences of discontent within the shop.

7. A housing project located approximately 500 meters from the plant provided quarters for plant employees assigned a room nine by twelve feet in dimension, which had gas, electric and water facilities. This space accommodated family of three persons. Rental charges for this room were between 60 and 70 rubles per month.

Utilities

8. electric power for the refrigerator plant was obtained from the power station for the city of Saratov. The presses and lathes in his shop required 380-volt current, and light fixtures, 220-volt current. Gas and water lines from Saratov also served the plant, and the work areas were steam heated. charges for utilities in Saratov were very reasonable.

Physical Security

9. access to the plant area was simple. a pass permitted to enter all work areas except the assembly shop for which another pass was issued of a different color. There were no guards patrolling the plant perimeter, and only three or four women guards were stationed at the plant entrance.

10. there no instructions given for Civil Defense nor were there air raid shelters in the plant area.

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SOUTHERN PIPE PLANT in Nikopol

NIKOPOL PIPE PLANT

1. The Nikopol Pipe Plant, also known as the "Southern Pipe Plant" was located in a new suburb of the city of Nikopol, (N 47-33, E 34-26) in Dnepropetrovskaya oblast (see sketch No. 1 on page 12). It was situated about 200 meters from Prospekt Stalina which connected the new suburb to the old section of Nikopol, three and a half kilometers away.

2. This plant manufactured hollow needles for hypodermic syringes and tubing up to 50-centimeter exterior diameter; special piping was made under the close supervision of Naval officers. three other plants similar to this one existed in the USSR and a fourth plant was being constructed in the Caucasus. 25X1

3. The front of the plant was bordered by a garden and the back gave way to open fields. Except for the administration building, the plant buildings were not discernible from the outside since many pines and bushes were planted in such profusion that one had the impression of looking at a park.

4. Until 1948, the plant contained only one manufacturing section called the SGB (not further identified); but after that year the plant was increased to its present size (see sketch No. 2 on page 13). In 1956, the plant contained the following manufacturing sections in addition to the SGB: The First Section and the Second Section (built in 1948) and the "Secret" Section which was still under construction in 1956. These structures measured about 300 x 150 x115 meters each, were of fireproof brick construction with a skylighted uralite roof supported by metal columns which divided the work space into five large areas.

5. The SGB Section (See No. 1 of Sketch No. 2 on page 13) had the blast furnaces inadequately located in the center of the shop; raw material had to be conveyed to the center of the section and then back again for the next process. This section manufactured tubes from the caliber of hypodermic needles to five-centimeter exterior diameter pipe for furniture construction and operating room equipment. The five-centimeter rods were hot-drawn; the smaller caliber were cold-drawn. there was no military production in this section. The machinery was old and of Soviet make; some of it was marked "Leningrad". The three shifts in this section employed from three to four thousand workers. 25X1

6. The First Section was located thirty meters behind the SGB Section, (See No. 11 on Sketch No. 2 on page 13). Half of the machinery in this section was old; the rest was of German origin which had been brought from Rumania in 1948. The pipes manufactured in this section were from six to 17-centimeters exterior diameter and were saw-cut.

7. The Second Section, manufactured iron and stainless steel pipe from 17 to 50-centimeter exterior-diameter for water mains and other purposes. The pipe, which was also made from the German machinery brought from Rumania, was exported to China, Lithuania, 25X1 25X1

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and other Satellite countries. About 2,000 to 3,000 workers were employed among three shifts. The volume of production varied according to the size of the pipe (See Production Chart No. 6 of Second Section on page 17).

8. Billets arrived at the Second Section in a five-freight car train drawn by a steam locomotive; the middle car contained a crane which could reach the two cars on each end. The crane removed the billets from the railroad cars and placed them on a runway where they rolled by gravity to the blast furnace.

9. The conveyor system consisted of motor-driven center-tapered rollers. Small individual electric motors operated gangs of four to five rollers (there were five rollers for each three meters of the 250-meter conveyor system).

10. The following describes the manufacturing process of the Second Section in detail. (Numbers in parentheses in the margin refer to Sketch No. 4 on page 15 . Processes numbered (1) through (15) were called prokat):

(1) The furnace, which was lined with refractory brick, was a 20 x 35 x 3-meter structure with room for about forty half-meter-diameter cylinders. The furnace was fueled with heavy oil injected at great pressure through two centimeter-diameter holes. Ten men were employed here. Billets were subjected to a charging temperature of 600 degrees centigrade and the temperature was gradually increased to the desired heat of 1200 degrees before discharge. They were then placed on a chute where they were channeled onto a roller-conveyor which moved toward the next runway at the speed of a rapidly walking man.

(2) This runway was called provoznoy and at its base was a bumper.

(3) The billet was then set onto the piercing point in order to be drawn.

(4) This drawing machine contained a system of two rollers called valkanes (sic) which turned rapidly forcing the cylinder to turn on its axis as it moved ahead perpendicularly toward the piercing point.

(5) The piercing point bored the center of the billet. As the rod was being drawn into a tube, it became longer.

(6) Once the billet was pierced it was placed on a milling table. The piercing point which was red hot was removed and another one was set.

(7) The pipe was moved along by conveyor toward a runway which was called the second provoznoy which charged the pipe to another drawing machine.

(8) This drawing machine was similar to that in (4) and by the same process the tubes were again drawn but the enlarged bore was still not the desired caliber. The pipes were moved by conveyor to a runway (9).

(9) The pipes were measured here.

(10) A charger introduced the tubes to another drawing machine and the tubes were passed several times until the desired length was attained. This machine was similar to machines (4) and (8). The interior diameter was enlarged again and the red-hot pipe was discharged onto a conveyor and moved to another drawing machine.

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(11) This machine was called rilin (sic) and though it was similar to the above-mentioned drawing machines, it was more precise. The tubes were introduced on a tapering mandrel and the pipes were drawn to the exact caliber desired. The interior diameter was thoroughly cleaned. This was a double-draw-bench with two sets of rollers and two piercing points. At this point the pipes were cooler, having changed from a red-orange color to black. The conveyor moved the pipes onto a milling table.

(12) This machine was called kalibr and consisted of five sets of rollers which squeezed the pipe gradually reducing the exterior diameter. The pipes were then passed onto a control table.

(13) This was the first control table and consisted of a chain conveyor which moved the pipes along while the men in charge measured the caliber, thickness, and exterior diameter. Defective pipes were lifted by crane to the train and hauled back to the furnaces to be reheated. Pipe which passed inspection was passed on by conveyor to another machine.

(14) This machine was similar to (12). The pipes were introduced on a mandrel and turned on their axes as they were being pressed straight. They were constantly water-cooled while in the machine. The pipes were then conveyed to the second control table.

(15) This was the second control table. A row of workers on either side inspected the inside of the pipes with the aid of powerful electric lights and rejected defective pipe (those with cracks, marks, or grooves).

(15) bis. Finished pipe was passed along to the stockpile where it was classified in three categories depending on quality. This was the end of the conveyor system.

(16) A crane. This hauled pipe from the stockpile to Shop (17).

(17) This was the bearing shop where pipes were cut into sections for the manufacture of ball bearings. Balls for the bearings were brought in from an unidentified plant.

(18) Tubes which were to leave the plant in pipe form went to Shop (18) where the ends were evenly sheared. Thirty cutting machines were necessary to keep pipe moving from the stockpile; furthermore, cutters became dull and overheated through constant use.

(19) A crane picked up the pipes and placed them on a runway where they slid down to another stockpile.

(20) Stockpile. The cranes again picked up the pipes and brought them back to the cutting machines for further shearing. When the pipes were sheared on both ends they were re-deposited in the stockpile. A crane picked them up and placed them on a runway which led to the threading machines.

(21) Runway which led to the threading machines.

(22) Exterior pipe-threading machines. There were only 20 of these machines as they worked rapidly and efficiently. The pipes were then carried to the stockpile.

(23) The pipes were then sent back to the exterior pipe-threading machines (to thread the other end).

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(24) Three cranes. The two on the left served the other one which deposited the pipes on a table.

(25) Table which moved the pipes along to a charger.

(26) Charger which placed the pipes into a secondary annealing furnace.

(27) Furnace which measured 15 x 15 x 6 meters and handled ten half-meter-diameter pipes at a time. The pipes were heated until they were red (exact temperature unknown) and they were then discharged and conveyed to an oil-tempering bath.

(28) The pipes fell into the tempering bath which measured 12 x 2 x 1.5 meters. A constant flow of oil (under pressure) flowed into the tank. The oil passed through a 15-centimeter opening. The oil, heated in the tank, flowed out of one end, was cooled by turbines, and returned to the tank. Once the pipes were tempered, they were removed from the tank by crane and deposited on a runway.

(29) The pipes rolled down the runway shaking off the oil as they rolled toward the stockpile.

(30) A stockpile. Cranes again picked up the pipes and set them on tables.

(31) The pipes were classified according to size.

(32) The pipes were moved by crane to the runway leading to the cutting machines.

(33) These cutting machines cut the pipes into sections and the interiors were threaded for fittings.

(34) Freightcars hauled the pipe to tables (31) for classification. Fittings were attached to the pipe sections and the manufacturing process was complete. Pipes were painted and the white shipping labels were attached.

(35) Three cranes deposited the pipes on freight cars.

(36) The MVD guard house was located at the railroad exit. The guards filled out the shipping labels, made careful inspection of not only the shipment by the freight cars themselves, and finally gave permission for the train to leave.

(37) Special costly metal, probably nickel, was stored in this stockpile.

(38) Electric power station. A 40 x 15 x 6-meter brick structure which contained three large machines in constant use. This was dependent on the plant's main power station.

(39) Stockpile for stainless steel cylinders which were arranged according to size.

(40) Washrooms, dining rooms, tool shop, lavatories.

(41) Chiefs' meeting room.

(42) Laboratory.

(43) Party Secretary's office.

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(44) Syndicate office.

(45) Construction chief's office.

(46) Deputy chief's office.

(47) Section chief's office.

(48) Plans office.

(49) Control office.

(50) General offices.

11. Special pipe was also manufactured in the "Second" Section under the close supervision of three or four naval officers, the plant directors, engineers, and scientists numbering about thirty men. These personages inspected the billets as they were discharged from the blast furnaces and followed the entire manufacturing process.

12. When the above-mentioned special pipe was in process, the personnel was advised to have the machines in perfect working condition and the directors would excitedly shout from time to time during the manufacturing process "careful, it is costing millions". To give another idea of the importance of these special pipes, on an eight-hour shift, 300 to 320 of the regular pipes were produced, but only 6 to 8 of the special pipes were produced in the same amount of time.

13. Also, during this process, 20 or 30 female laboratory assistants, who were Party members, noted down the temperature of the pipe as it went through the different machines and were constantly collecting data which they gave to their chiefs. The apparatus they used was of US and German make. 25X1 As one looked through it and focused the instrument, the image of the pipe came through clearly and the temperature was gauged. 25X1

14. These special pipes usually had an exterior diameter of 50 centimeters and a wall-thickness of about 45 centimeters. The pipes were not threaded and sometimes the ends were not sheared, but they were constantly being tested. 25X1 In 1953, test bearings (sic) were constructed for the interior of these special pipes but nothing further was done 25X1

15. The "Secret" Section was located in a 150 x 150-meter one-story structure located about 250 meters south of the main power plant. This was still under construction in 1956. In this section, pipes were to be manufactured by a system which consisted of bending metal plates and joining the edges 25X1 by welding. The workers in this section were Party members and received a special salary. A special pass was necessary to enter this section, but as the section was not yet in operation, no special guards were on duty.

16. The administration building was a 30 x 20-meter four-story, brick structure with uralite roof located about 200 meters from the SGB building. It contained the offices of the directors, engineers, technicians, and Party leaders. It is described in detail in Sketch No. 3 on page 14.

17. There was no difficulty in meeting the production norms even though they were always being increased. Since there were three shifts, one would turn out more work than another. The Section Chief and the masters would violently rebuke those shifts which had produced less and praise the one producing more. The winning shift was rewarded monetarily at the expense of the losing one which was required to work faster the next month to make up the pay loss. Thus, a vicious competition prevailed among the three shifts unless the workers got together and agreed to produce less. 25X1

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18. The chiefs of the Second Section always withheld some production at the end of the month so that if they had not reached their production level in a certain month they could deliver this reserve. When there were no reserves to deliver, they falsified the production figures in the Party Chief's section, thus involving the Party Chief himself.

19. Sometimes production would be interrupted because the Dneper had frozen cutting off the electric power, or because of a supply shortage. In the latter case almost-standstill-production might last as long as a week.

20. upon Stalin's death, the billets coming by rail from the Rustaf blast furnaces in the Caucasus were often defective. This was blamed on sabotage to avenge the violence used by Yukov in establishing order in that area. 25X1

21. sample 60 to 70-centimeter pipe was produced, but this greater diameter pipe was never put into production. 25X1

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23. Each section had a ten-day emergency supply of iron and stainless steel billets. There was no outside emergency supply dump.

24. Oil Warehouse. Oil, broughtin by railroad tank cars was stored here. A one-meter diameter pipe line began at the warehouse and was gradually reduced as it entered the various manufacturing sections of the plant. The used oil was returned to the oil warehouse for purification or used for fuel. Although the sections appeared to be sufficiently supplied, in 1956, the oil pipeline had been extended (see No. 18 on Sketch No. 4 on page 14). No special guards were posted here 25X1

25. The Plant Security building was a seven by six meter-building. The guard complement consisted of between 50 to 60 men during the day and about 80 at night. The plant was surrounded by a brick wall about three meters high which was topped by some five to six parallel high tension wires. Watchtowers were located at intervals of 200 to 250 meters and were guarded day and night. These towers were camouflaged by earth-color paint and were constructed twenty meters inside the wall. A number of dogs were leashed to a wire which was stretched along the inside of the wall. Guards patrolled the space between the dogs and watch towers 24 hours a day. High columns with powerful flood-lights illuminated the whole area at night. These were placed every 100 to 125 meters around the plant perimeter.

26. The plant contained the following entrances which are shown by the following numbers on Sketch No. 2 on page 13; Entrances No. 2 and No. 3 for employees, Entrance No. 4 for the railroad siding, Entrance No. 5 for motor vehicles, and Entrance No. 6 for administrative personnel. Guards were stationed at the employee entrances No. 2 and No. 3 to check passes.

27. The Pass-Issuing Office was a four by five-meter structure which was located next to the fire station. In order to enter the plant, one had to show a propusk. These were all of the same color except for the stamp.

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The propusk stated the section which the worker was authorized to enter. The "Secret" propusk for the secret building was the same color but had an "S" which differentiated it from other passes.

28. The entrances had movable bars across the lane; at the beginning and end of each passage there was a guard who inspected passes. Passes were renewed every three or four months. Workers were advised by bulletin boards when their passes were about to expire. If the worker presented an expired pass he was detained at the entrance, obliged to renew it, and was docked 25 percent of his day's pay.

29. Entrances and exits to the individual sections were also guarded since employees were not permitted to move from one section to another. However, one could pass the guards by requesting permission to go to another section to borrow a tool. Entrance to the "Secret" Section was impossible without proper authorization.

30. Visitors to the plant were required to apply for a pass stating the purpose and approximate length of their visit. If more time was needed, they had to advise the guard office of the change.

Special Security Measure

31. In 1954 or 1955 several floodlights were placed on tall columns throughout the plant enclosure. Heavy cables were stretched along these columns and those of the fence. Canvas was suspended from the cables. By pressing a switch in the plant security office, the canvas slid along the cables covering and camouflaging the entire plant area, including smokestacks and trees. At the time these canvases were installed the brick smokestacks were replaced by lower and wider 15-meter high metal smokestacks. [redacted] testing of this camouflage [redacted] left the plant in complete darkness (the canvas was painted black on the inside) for an hour. [redacted] aerial photos taken of the plant while the test was being made. In these negatives the plant blended with the open fields however, some negatives showed trains and vehicles entering the plant and some showed smoke billowing up. Later another test was made and canvases were also placed along the sides of the plant area. 25X1 25X1 25X1 25X1

32. The plant Fire Station was a five by four-meter structure (see No. 7 on Sketch No. 2 on page 13) which employed 15 men permanently.

33. The Main Power Plant (see No. 13 on Sketch No. 2 on page 13) which was located west of the Second Section also supplied the village with electric power. This was a 40 x 15 x 7-meter brick building. Thick cables led from the power plant to seven five-meter-high transformers. Transformers (spaced six meters apart in a square area, the seventh being larger and in the center) and the power plant building occupied an area of 60 x 50 meters. Thick barbed wire surrounded the area and guard dogs were leashed to a wire which stretched around the installation. There were a great many lightening rods in the area. Eight or ten workers were employed here and entrance to the installation was forbidden to unauthorized personnel.

34. Electric power generated was not adequate for plant needs. At least once a week the power supply was interrupted. If, by the end of the month, the plant had met its production quota, production was stopped for two or three days, especially when one-half-meter pipe was being produced. (A great deal of electric energy was used just to move the conveyor rollers.) At other times, the town's current was cut off so the plant's supply could be increased. The SGB, First and Second Sections also contained individual power stations.

35. Electric power for the plant was produced by two dams built along the Dnepr River, one located in Dnepropetrovsk which was 120 kilometers away and the other in Zaporozhye, 60 kilometers away; the latter said to have been the best dam in the world. See Sketch No. 5 on page 16 of Zaporozhye Dam Site which was described as follows: The dam contained about 15 sluices and five sets of locks. Five heavy cables were stretched across the dam site. The power line extended from the Dnepr to Zaporozhye passing unsheltered cement-based transformers which gradually reduced the number of cables to only one at Zaporozhye. The area was surrounded by a thick wire fence, well-guarded by soldiers.

36. Transportatinn in the plant was chiefly by rail but some truck transportation was also used. The plant owned some sixty trucks with garage facilities including a repair shop and gas pump. Soviet-gauge track thoroughly serviced the various plant sections. The trains, which consisted of four freightcars plus a crane-car in the middle constantly brought in supplies and hauled away finished pipe thus obviating the necessity of loading platforms. There was one road to the plant called Prospekt Stalina. This was a 15-meter-wide asphalt surfaced road with a half-meter thick gravel roadbed. This was an all-season road; however, for a few days during the winter, snow made transportation impossible on this road. Trucks were used for light, short-distance hauling. Transportation of material from one side of a section to another was sometimes by truck.

37. Storage for finished products was not necessary as they were immediately shipped out. Billets were stored in the open in four-meter-high piles in an area which was larger than the combined building area.

38. Working conditions in this plant were described as follows: The plant employed about 15,000 people (laborers, white-collar workers and administrative employees). [redacted] about 60 percent of the employees were specialized.

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39. Workers were not paid for unproductive labor. They worked on Sundays without pay to clean and repair their machines and were given a week day off without pay. The Payroll Office which employed about 50 to 60 office workers could reduce workers' wages for any reason. Each pay day, the office had to pacify many workers protesting the latest wage deduction.

40. Light labor workers with seniority were given 15-day vacatinns and 24 days were given to those with hazardous jobs. Workers were entitled to a vacation after one year but they had to ask permission one month in advance. Previously, if a worker did not take his vacation he would be paid for this time, later it was decided that the worker would not be paid for unconsumed vacation time. Only ten workers each year could spend their vacations in rest homes.

41. Each section had the following types of executive personnel:

A section chief.
A deputy chief who substituted for the chief when he was absent.
A Party secretary, the actual chief, who assumed the direction of the section and was held in awe by the section chief.

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42. [redacted] plant personalities:

(1) Truvchenko (fnu) He was the general director of the plant. [redacted]

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(2) Leonov (fnu) He was the chief engineer and the Deputy-Director.

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(3) Abraham Sobelov. Chief of the Second Section

(4) Kuzenko (fnu) Technical Chief of the Second Section;

(5) Fritman (fnu) He was the engineer in the second section in charge of night shift.

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(6) Kribenko (fnu) He was a long-time Party member and was in charge of personnel and case histories of the employees.

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Legend for Sketch No. 2 on page 13 of the Nikopol Pipe Plant Layout

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1. SGB Building
2. Workers' Entrance
3. Bicycle Entrance
4. Railroad Entrance
5. Motor-Vehicle Entrance
6. Administrative Office Entrance
7. Fire Station
8. Propusk Office
9. Security Guard Office
10. Administration Building
11. Section One
12. Section Two
13. Main Electric Plant
14. "Secret" Section
15. Oil Supply Building
16. Garage
17. Outdoor Billet Storage

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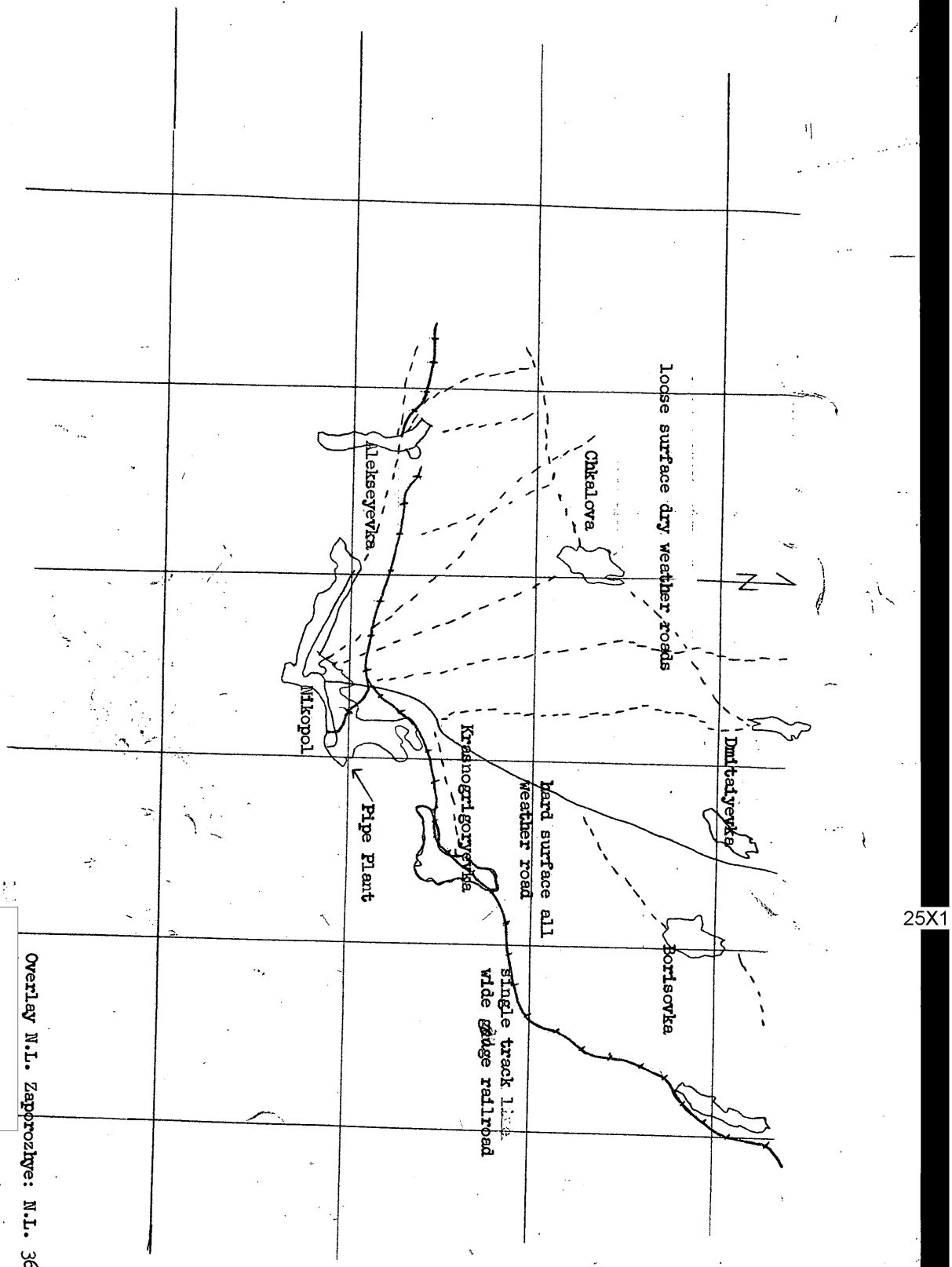
Sketch No. 1



Overlay N.I. Zaporozhye: N.I. 36-3

Scale 1:250,000

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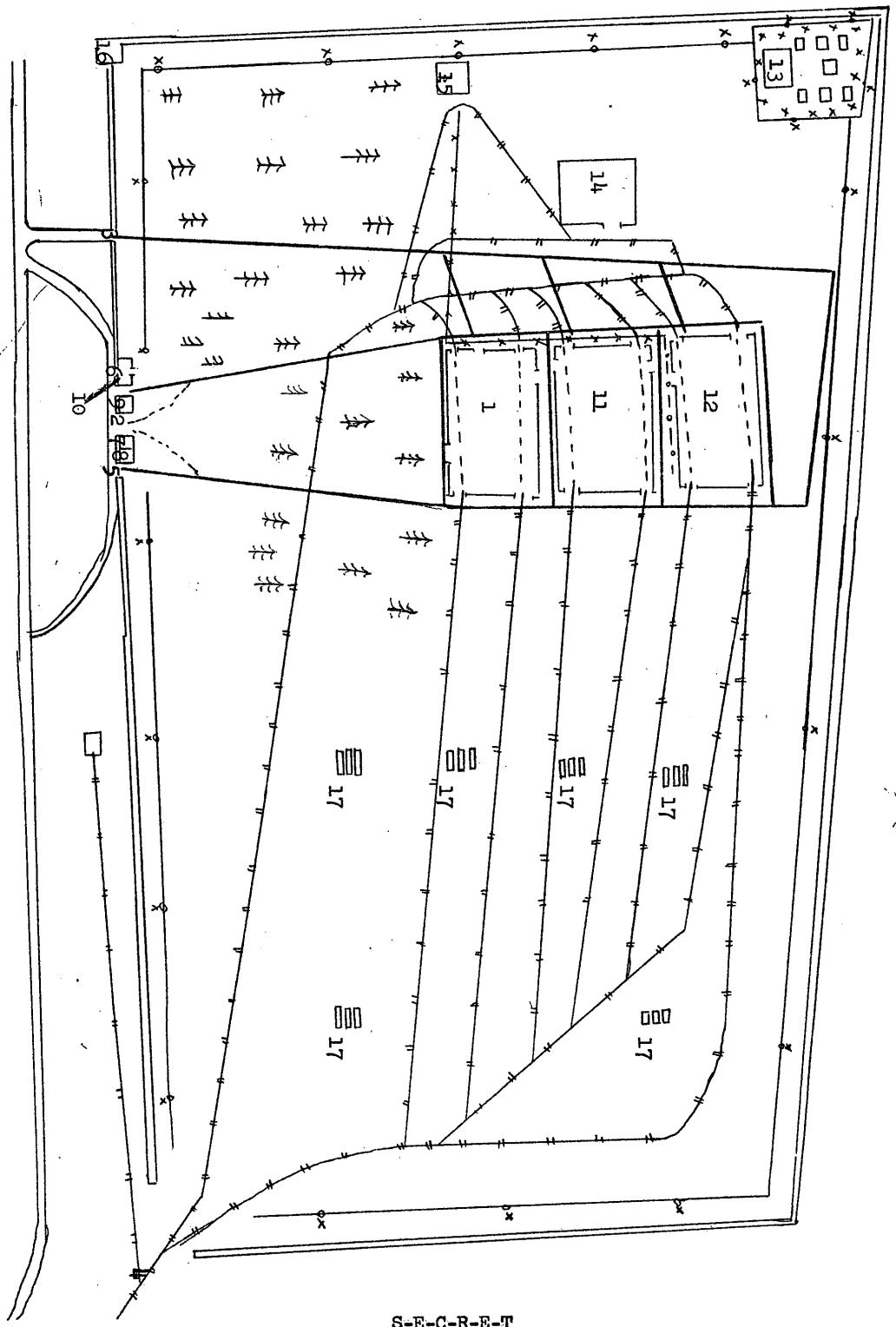
Sketch No. 2
Nikopol Plant Layout



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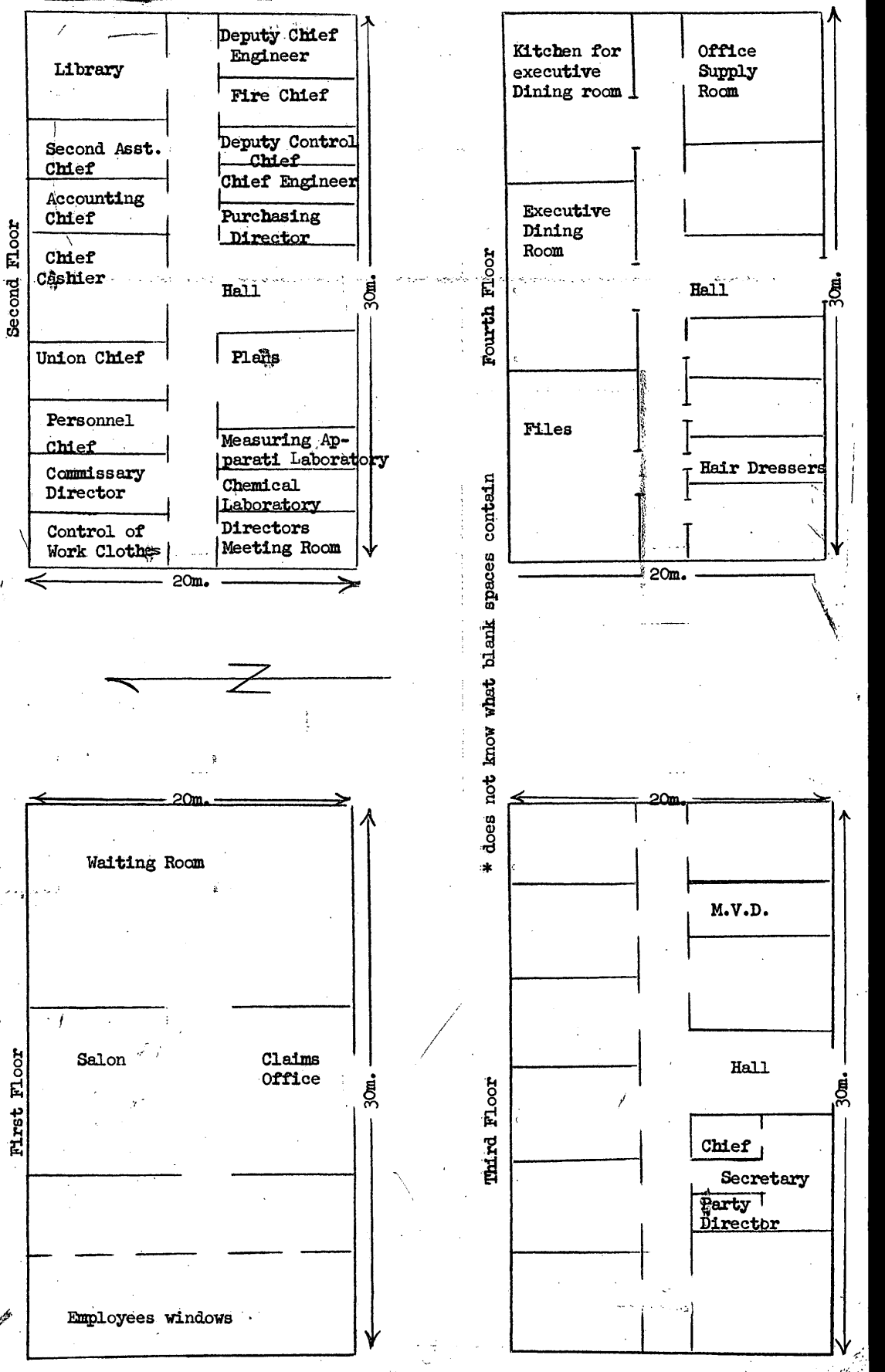
Sketch No. 3
Administration Building



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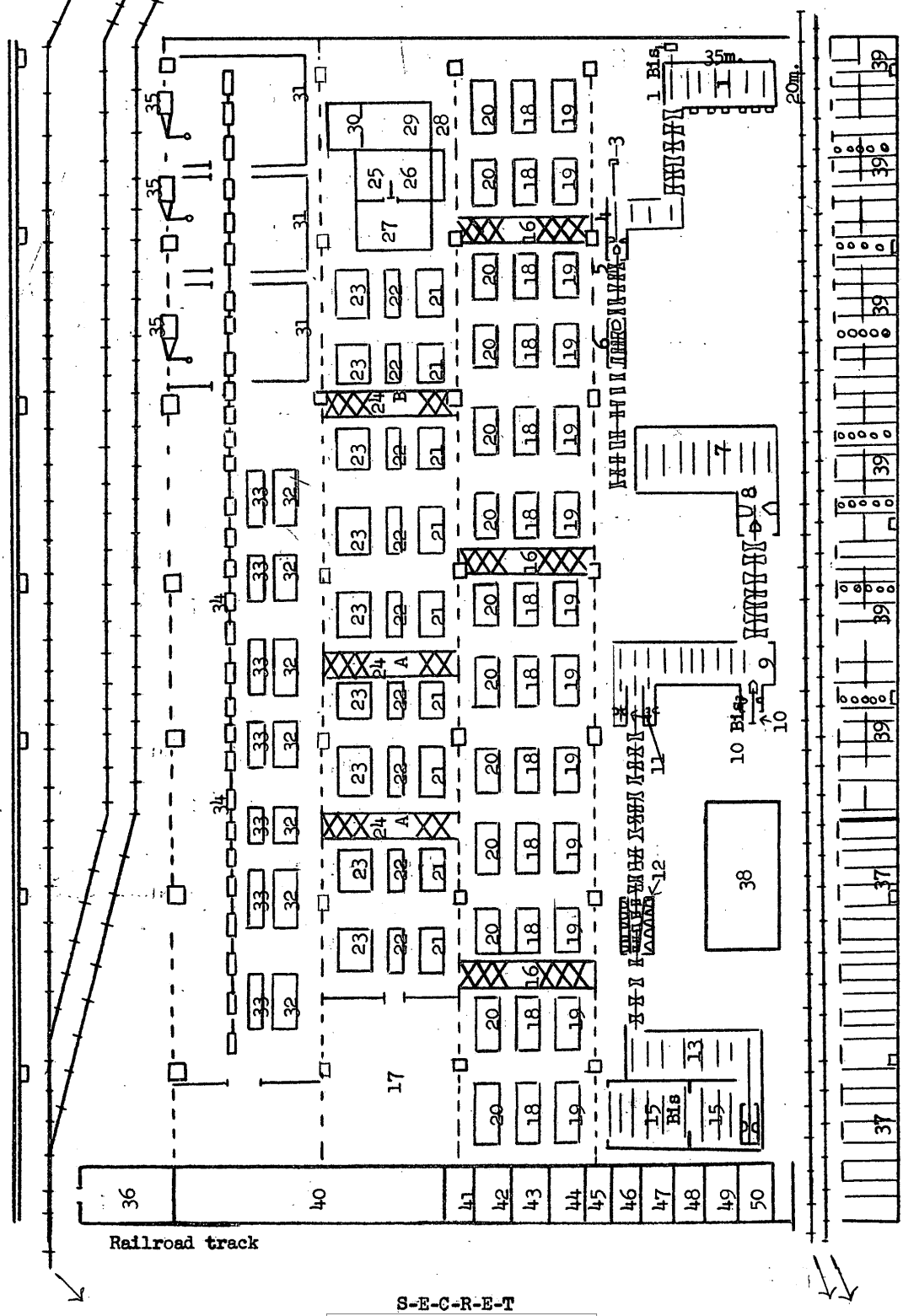
Sketch No. 4 - Second Section
Nikopol Pipe Plant



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Sketch No. 5
Zaporozhye Dam Site

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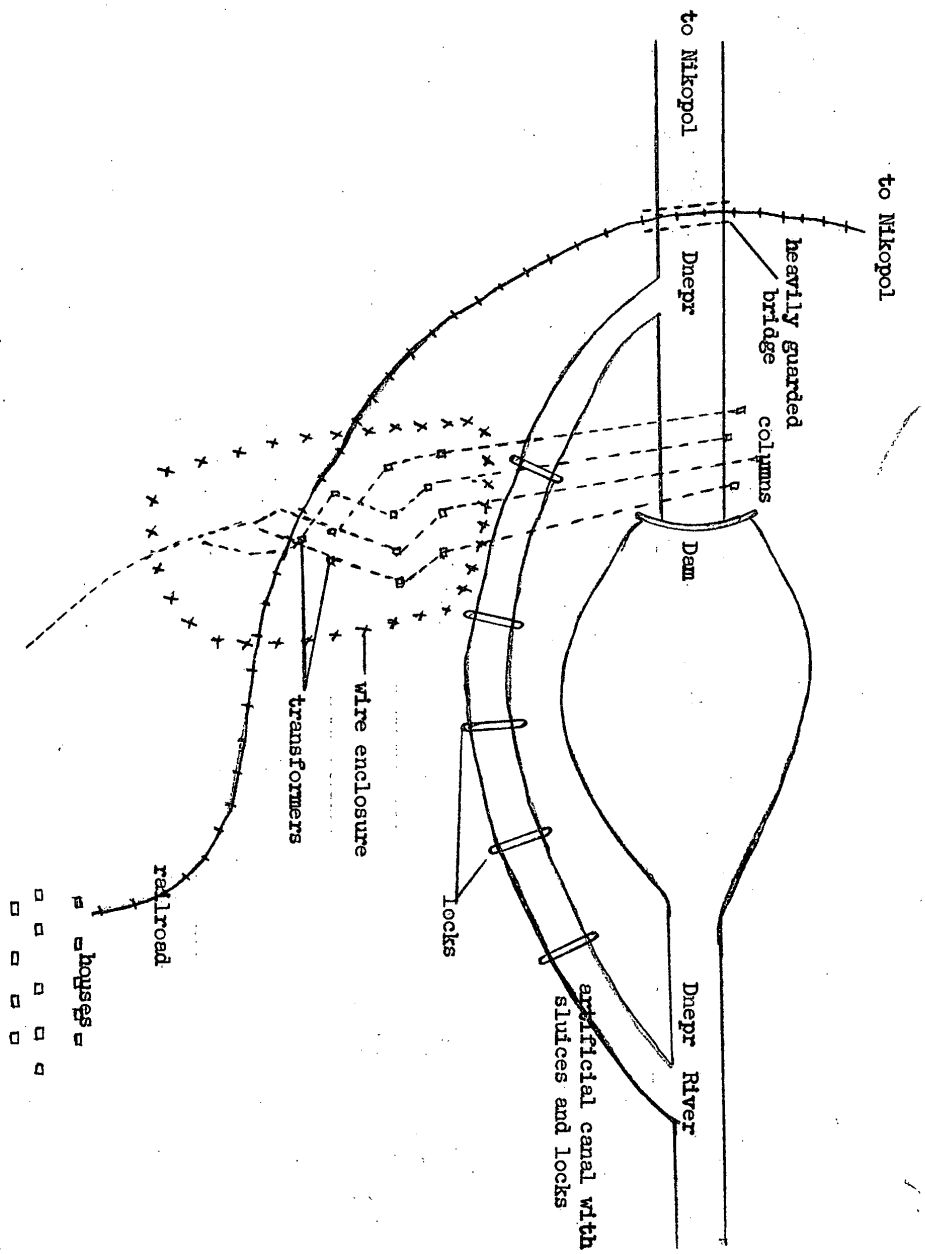

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Nikopol Pipe Plant Second Section Production Chart

Temperature	Exterior Diameter	Class	Caliber	Wall Thickness	Longitude	Amount produced each hour	Observations
1.150°	20 & 17 cm.	iron	16,50 cms.	5,50 m/m.	12 m.	130	Less length, greater quantity produced.
1.150°	20 & 17 cm.	iron	16,30 cms.	7 m/m.	12 m.	140-150	
1.150°	20 & 17 cm.	iron	16.10 cms.	9 m/m.	12 m.	160-170	
1.200°	17 cms.	stainless steel	16,50 cms.	5,50 m/m.	12 m.	8 to 10	
1.200°	17 cms.	stainless steel	16,30 cms.	7 m/m.	12 m.	8 to 10	Special pipes for the Navy.
1.200°	17 cms.	stainless steel	16,10 cms.	9 m/m.	12 m.	8 to 10	
1.200°	30-40 cms.	iron	29'3-39'3	7 m/m.	12 m.	150	
1.200°	30-40 cms.	iron	29 - 39	10 m/m.	12 m.	170	
1.200°	30-40 cms.	iron	28'5-38'5	15 m/m.	12 m.	190	Less length, greater quantity produced.
	30-40 cms.	stainless steel		30 m/m.	8 m.	3	
	30-40 cms.	stainless steel		50 m/m.	7 m.	2	
	30-40 cms.	stainless steel		80 m/m.	6 m.	1	
	30-40 cms.	stainless steel		120 m/m.	4 m.	1 every 2 hours	
	45-50	iron		20 m/m.	12 m.	30	
	45-50	iron		40 m/m.	12 m.	40	Less length, greater quantity produced.
	45-50	iron		60 m/m.	12 m.	50	
	45-50	stainless steel		120 m/m.	12 m.	1	Special pipes for the Navy.
	45-50	stainless steel		160 m/m.	12 m.	1 every 2 hours	
	45-50	stainless steel		200 m/m.	12 m.	1 every 2½ hours	

Sketch No. 6